Evolutionary Systematics. 7 2023, 35–50 | DOI 10.3897/evolsyst.7.94403

Revisiting the South American Acanthocephalini (Hemiptera, Coreidae): *Spilopleura* Stål (status novum)

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Academic editor: Martin Husemann ♦ **Received** 2 September 2022 ♦ **Accepted** 29 October 2022 ♦ **Published** 3 January 2023

Abstract

The family Coreidae is composed of some of the larger terrestrial Heteroptera, with showy colors and expansions on the legs, the antenna or the pronotum. Among the Neotropical fauna, the tribe Acanthocephalini Stål, including 18 genera, is recognized by the strongly deflexed juga, and the conspicuously projecting tylus. In the same work in which Stål established the tribe, he described two new subgenera to the genus *Acanthocephala* Laporte (currently synonymized under it): *A.* (*Metapodius*) (replaced for *Metapodiessa* Kirkaldy) and *A.* (*Spilopleura*). In the present work, the subgeneric name *Spilopleura* is removed from synonymy under *Acanthocephala* and elevated to generic rank, and the species *A. parensis* (Dallas) and *A. ochracea* Montandon are transferred therein. The genus *Spilopleura* **status nov.** and both included species are redescribed and illustrated, including characters from male and female genitalia; and a distributional map is given with the first records of the species from Argentina, Colombia, Paraguay, and Peru.

Key Words

Acanthocephala, Heteroptera, new genus, neotropical fauna

Introduction

The Coreidae, or leaf-footed bugs, have a cosmopolitan distribution showing greater diversity in tropical and subtropical areas, and includes some of the larger terrestrial Heteroptera, often with striking colors and expansions on the hind femora or tibiae, pedicellus and/or basiflagellomere, and the pronotum (Schuh and Weirauch 2020). The family contains 446 genera with about 2583 species worldwide (Coreoidea Species Files 2021). Four subfamilies are currently recognized, with the Coreinae containing the majority of the species organized in several tribes, some of which may not be monophyletic (Schuh and Weirauch 2020).

Stål (1870) established the Neotropical tribe Acanthocephalini (originally as the subfamily "Acanthocephalina") including eight genera: *Acanthocephala* Laporte, *Empedocles* Stål, *Laminiceps* Costa, *Lucullia* Stål, *Thymetus* Stål, *Petalops* Amyot and Serville, *Plaxiscelis* Spinola, and *Stenocelidea* Westwood. Subsequently, two of these genera (*Plaxiscelis* and *Stenocelidea*) were removed (Schaefer 1968; Packauskas 2006), and another twelve were included (*Anomalopetalops* Brailovsky, *Antipetalops* Brailovsky, *Cervantistellus* Brailovsky and Barrera, *Cleotopetalops* Brailovsky, *Cryptopetalops* Brailovsky, *Ctenomelynthus* Breddin, *Ichilocoris* Brailovsky and Barrera, *Leptopetalops* Breddin, *Meluchopetalops* Breddin, *Salapia* Stål, *Stenometapodus* Breddin and *Zygometapodus* Brailovsky), leaving the tribe Acanthocephalini composed of 18 genera at present. Stål did not describe or diagnose Acanthocephalina. Nonetheless, it is distinguished by the strongly deflexed juga, and the conspicuously projecting tylus beyond juga as a distinct knob or a strongly compressed plate (Packauskas 1994).

In the same work, Stål described two new subgenera in *Acanthocephala*: *A.* (*Metapodius*) including six

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species (later replaced for *Metapodiessa* by Kirkaldy 1902); and *A.* (*Spilopleura*) with only one species, leaving the nominotypical *A.* (*Acanthocephala*) with three species. According to Stål, *A.* (*Spilopleura*) is defined by the presence of three patches of decumbent yellowish setae in the thoracic pleura, the narrow apex of the metatibia, a central yellowish line extending across all abdominal tergites, and the absence of an expansion on the third abdominal sternum (second visible). These subgeneric names were only mentioned a few times in the literature (Berg 1879; van Duzee 1916; Pennington 1922; McPherson et al. 2011 [*A.* (*Acanthocephala*) and *A.* (*Metapodiessa*)]; and Blöte 1938 [*A.* (*Spilopleura*)]). Most authors omitted the subgenera when dealing with *Acanthocephala* species and this is probably the reason why Packauskas (2010) listed the names as synonyms in the New World Catalogue.

At present, the genus *Acanthocephala* includes 26 species distributed from Canada to Argentina (Henry 2009; Coreoidea Species Files 2021). According to Brailovsky (2006) and McPherson et al. (2011), the species of this genus are recognized by the sharply pointed tylus projecting beyond the juga as a compressed plate, the strongly incrassate and dorsally spined or tuberculate hind femora in males, and the sinuate or toothy expanded hind tibiae in both sexes. However, this set of characters are shared by other genera in the tribe, and there are no other ones to characterize the genus.

In the present work, we remove *Spilopleura* from synonymy under *Acanthocephala* and elevate it to generic rank including two species: *A. parensis* (Dallas), the only species originally included by Stål in the subgenus, and *A. ochracea* Montandon. The genus *Spilopleura* status nov. and both included species are diagnosed, redescribed, and illustrated, including characters from male and female genitalia. A distributional map of the species is also included.

Materials and methods

Specimens were examined under an Olympus SZ1000 and a Nikon SMZ1000 stereomicroscope. Digital images were taken with a Micrometrics 391CU, 3.2m, Accu-Scope digital camera attached to the Nikon SMZ1000 stereomicroscope. Images were stacked using HeliconFocus 6.7.1 software. The genital capsule of males and genital segments of females were dissected and cleared with a saturated potassium hydroxide solution (10%), and in the case of the male genitalia, the *aedeagus* was also immersed in lactic acid for final clearing and better handling. Finally, the dissected structures were washed in distilled water, place in glycerin for observation and preserved in microvials attached to the same pin of mounted specimens. For the description of the genitalia the terminology used is that of Singh-Pruthi (1925) for males, and Scudder (1959) and Pluot-Sigwalt and Moulet (2017, 2020) for females.

The following abbreviations are used for the institutions cited in the material examined:

IFML Instituto Fundación Miguel Lillo, San Miguel de Tucumán, Argentina;
MACN Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Ciudad de Buenos Aires, Argentina;
MGAB Muzeul Naţional de Istorie Naturală Grigore Antipa, Bucarest, Romania;
MLP Museo de La Plata, La Plata, Argentina;
MZSP Museu de Zoologia da Universidade de São Paulo, Sao Paulo, Brazil;
NHMUK Natural History Museum, London, England;
PUJ Departamento de Biología, Pontificia Universidad Javeriana, Bogotá, Colombia;
SDEI Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany;
UNAL Universidad Nacional de Colombia, Bogotá, Colombia;
UNAM Instituto de Biología, Universidad Nacional Autónoma de México, Ciudad de México, Mexico.

We selected 23 measurements to described species, as follows:

***total length*:** in lateral view, from apex of tylus to tip of abdomen;
***head length*:** in dorsal view, from apex of tylus to posterior margin of ocellar tubercles;
***max head width*:** in dorsal view, from outer margin of right eye to outer margin of left eye;
***tylus length*:** in dorsal view, from apex of tylus to the beginning of post-tylus depression;
***post-tylus depression length*:** in dorsal view, from tip to tip of depression;
***eye width*:** in dorsal view, from inner margin to outer margin of an eye, maximum width;
***interocular space*:** in dorsal view, distance between inner margin of eyes;
***ocellar distance*:** in dorsal view, from outer margin of right ocellus to outer margin of left ocellus, maximum width;
***interocelar space*:** in dorsal view, distance between inner margin of ocelli;
***antennal articles length*:** from base to apex each;
***antennal articles width*:** maximum width each;
***length of labial segments*:** in lateral view, from base to apex each;
***humeral angles width*:** in dorsal view, maximum width;
***scutellum length*:** in dorsal view, from base to apex;
***scutellum width*:** in dorsal view, maximum width at base of scutellum;
***hemelytra length*:** in dorsal view, from base to apex;
***profemur width*:** maximum width;
***metafemur width*:** maximum width;
***metafemur length*:** from base to apex;

***metatibia width*:** maximum width;
***metatibia length*:** from base to apex;
***abdomen length*:** in lateral view, from base to apex;
***abdomen width*:** in dorsal view, maximum width.

All measurements are in millimeters and are expressed as: minimum -(average)- maximum.

Results

Taxonomy

Family Coreidae
Subfamily Coreinae
Tribe Acanthocephalini

***Spilopleura* Stål, 1870, status nov.**

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1870 *Acanthocephala* (*Spilopleura*) Stål, 150 [n. subgen.; type species: *Metapodius parensis* Dallas 1852].
1938 *Acanthocephala* (*Spilopleura*): Blöte, 275.
2010 *Acanthocephala* (*Spilopleura*): Packauskas, 13 [synonymized under *Acanthocephala*].
2021 *Acanthocephala* (*Spilopleura*): CoreoideaSF Team [as synonym of *Acanthocephala*].

Type species. *Spilopleura parensis* (Dallas).

Diagnosis. Pronotum without tubercles, posterior pronotal lobe always punctate; apex of scutellum flat, never incrassated or with an apparent callosity; with a conspicuously rounded or conical, but never spinose, projection on the metathoracic acetabulum; and metatibia conspicuously expanded.

Redescription. Male. ***Head.*** Dorsally flat, lateral margins parallel (Fig. 1A). Post-tylar depression visible. Preocelar pit deep. Eyes hemispherical, globose, and protuberant; postocular tubercle weakly exposed, visible in dorsal view (Fig. 1A). Ocelli rounded and weakly elevated. Juga not visible from above, flexed below antenniferous tubercles (Fig. 1B). Buccula short and sub-quadrangular, extending beyond the anterior third of the eye (Fig. 1B). Antenniferous tubercles broad and oblique at apex (Fig. 1A). Antennae slender, as long as body length; scape cylindrical, stout and slightly curved outwards, inner side longitudinally ridged; pedicel and basiflagellomere cylindrical; distiflagellomere elongate and narrowly fusiform. Antennal segments decreasing in length from scape to basiflagellomere, and the distiflagellomere is the longest. Labium reaching or surpassing the mesocoxae. ***Thorax.*** Pronotum trapezoidal, steeply declined; with distinct collar, frontal angles blunt; anterior lobe smooth and unarmed, calli almost flat; anterolateral margins straight and slightly crenulate; posterior lobe punctate without tubercles on the disc; humeral angles slightly enlarged, extending laterally into a small spine directed backwards; posterolateral margins tuberculate; triangular processes short. Scutellum transversely striated, lateral margins thickened; apex flat never thickened. Hemelytra extending beyond the apex of abdomen; clavus and embolium with decumbent yellowish setae, with punctures along and next to the veins and in the center of the cells, costal edge unarmed; membrane glabrous. Thoracic pleura without tubercles, episterna striated, epimera punctate; metathoracic gland auricle well developed, lobes of auricle rounded, posterior lobe reduced; evaporative area striated; supracoxal area of metapleura incrassate posteriorly; metathoracic acetabulum with a conspicuous projection (Figs 2E, 6E). Prosternum with a deep concavity; mesosternum flat, with an anterior projection; metasternum flat. ***Legs*:** Coxae rounded and setose; pro- and mesotrochanters unarmed, metatrochanter with two small ventral setiferous tubercles. Pro- and mesofemora slender, with two rows of spines on ventral margin that become larger towards the apex; anterior, posterior, and dorsal margins of profemur unarmed. Metafemur incrassate, laterally compressed; dorsal margin with two rows of conical setiferous tubercles, with a conspicuous large spine near the base; ventral margin with two rows of spines that become larger to the apex and ends in a flat projection, posterior row less developed; anterior margin unarmed; posterior margin tuberculate. Pro- and mesotibiae unarmed and cylindrical, with the distal third almost quadrangular, with semierect yellowish setae over the entire surface, thicker and darker on the margins of the apical third. Metatibia with dorsal and ventral margins expanded; ventral expansion always tuberculate. ***Tarsi*:** Protarsus as long as the length of the meso- and metatarsus combined; meso- and metatarsus sub-equal. ***Pretarsi*:** Two claws and pulvilli well developed. ***Abdomen*.** Terga with one or two central lines extending along all abdominal tergites. Lateral margin of abdominal sternite III fold-like expanded (Fig. 2E). Connexival segments smooth. Spiracles well developed and closer to the anterior margin of abdominal sternites. ***Male genitalia*:** Pygophore globose, lateral margins declivent to the apex; posteroventral margin rounded, with a median depression or not; lateral margins of the anterior opening sinuous on medial part; transversal wall of pygophore short. Parameres symmetrical, basal shank wide, narrowing at the joint with the arm in both views, inner margin slightly expanded distally; arm perpendicular to basal shank, wide and slightly concave, narrowing to apex, ends in a downwardly directed apical dentiform process. ***Aedeagus*:** Phallosoma wide and membranous, with the basal region and the lateral margins sclerotized; conjunctiva membranous, with a pair of small ventral well sclerotized appendages that arise to the apex of two well-developed digitiform membranous sacs, and with two pairs of dorsal appendages: dorsal appendages I well sclerotized, large, broad and flat and lobulated apically; dorsal appendages II: small and membranous, posterior to the dorsal sac. Dorsal sac of conjunctiva large and membranous. Vesica well sclerotized, rolled up on itself, with almost two coils. Ejaculatory duct straight.

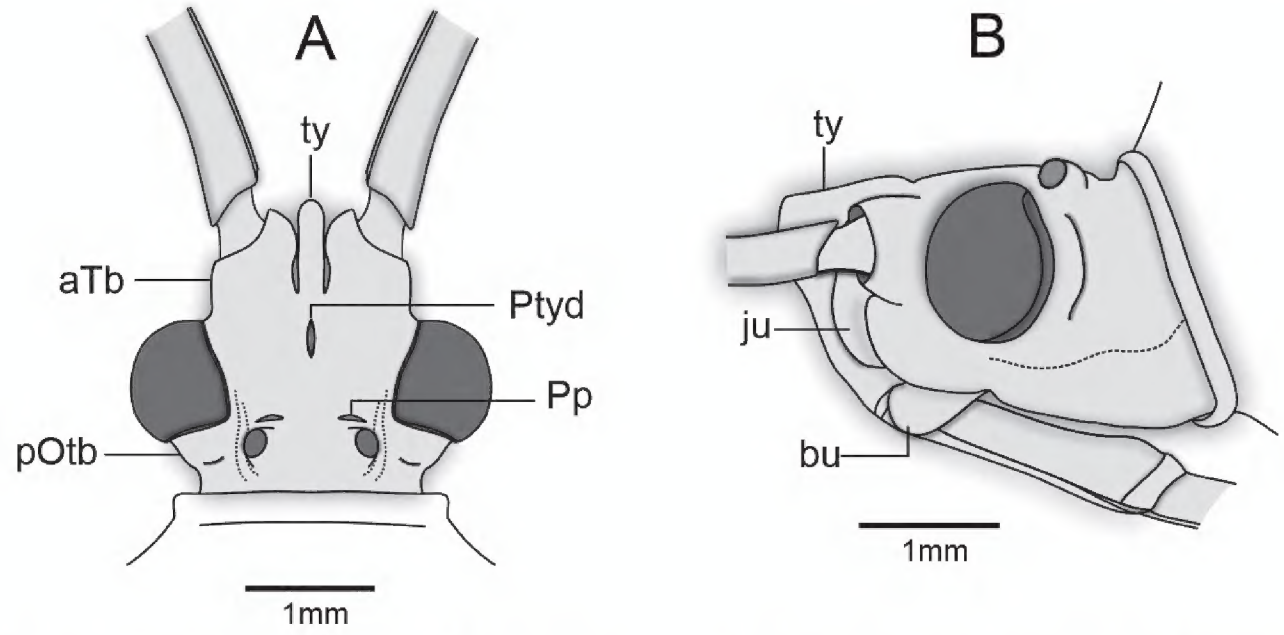

Figure 1. *Spilopleura* sp. Schematic drawings of head (**A**) Dorsal view; (**B**) Lateral view. Abbreviations: aTb: antenal tubercle; bu: buccula; ju: juga; pOtb: postocular tubercle; pp: preocelar pit; ty: tylus; Ptyd: post-tylar depression.

Table 1. Distribution and summary of material examined of the species of *Spilopleura* stat. nov. Abbreviations: ARG – Argentina, BOL – Bolivia, BR – Brazil, COL – Colombia, PAR – Paraguay, PE – Peru.

Species	Type locality	Distribution	Comments	Material examined
S. parensis (Dallas, 1852) comb. nov.	Pará (BR)	ARG, BOL, BR, COL, PAR, PE	Type species of *Spilopleura* stat. nov.	41 males, 37 females
S. ochracea (Montandon, 1895) comb. nov.	Cumbase (BR)	BR, PAR, PE		3 males, 2 females

Female. Structure and color similar to male. ***Thorax.*** Supracoxal area of metapleura not incrassate posteriorly. Metathoracic acetabulum without a conspicuous projection. Metatrochanter unarmed or with only one small ventral setiferous tubercle. Ventral margin of profemur with only one row of spines. Metafemur flattened and less developed than in males; spines of the dorsal margin without a conspicuous larger spine; ventral margin with two rows of flat spines that become larger to the apex and ends in a flat bidentate projection; posterior margin tuberculate or not. Expansions of the metatibia unarmed and more developed than in males. ***Abdomen.*** Expansion of abdominal sternite III absent. ***Female genitalia*:** Sternum VII with plica and fissure present. First gonocoxae large and triangular, distal angle rounded, proximal region of the outer lateral margin with a finger-like process for insertion of the muscles of the vagina (dorsal apodeme). First gonapophysis elongate, digitiform and hollow, basal and middle thirds punctate and with oblique striations and long setae, inner region of the distal third weakly sclerotized and with short and thick peg-like setae; first ramus straight and well sclerotized. Second gonocoxa elongate. Second gonapophysis elongate and well sclerotized, thickened distal region with a wide lateral tooth; second ramus well sclerotized, curved in basal region. ***Spermatheca*:** Type III, subtype D (Pluot-Sigwalt and Moulet 2020): Seminal receptacle tubular, sinuous and apically globose; intermedian zone straight, distal region with a well sclerotized and pigmented flange (distal flange), median region (flexible zone) straight, unsclerotized and unpigmented, proximal region with a slightly pigmented flange (proximal flange); spermathecal duct shorter than the seminal receptacle, with a dilation with thickened and strongly pigmented walls.

Spilopleura parensis (Dallas, 1852), comb. nov.

Figs 2–5

http://lsid.speciesfile.org/urn:lsid:Coreoidea.speciesfile.org:TaxonName:453703

1852 *Metapodius parensis* Dallas, 432 [n. sp., Brazil].
1859 *Metapodius parensis*: Dohrn, 26.
1864 *Metapodius parensis*: Costa, 76.
1870 *Acanthocephala* (*Spilopleura*) *parensis*: Stål, 9: 150 [n. comb.].
1871 *Metapodius parensis*: Walker, 50.
1873 *Metapodius parensis*: Walker, 33.
1894 *Acanthocephala parensis*: Lethierry and Severin, 31.
1938 *Acanthocephala* (*Spilopleura*) *parensis*: Blöte, 275.
1938 *Acanthocephala* (*Spilopleura*) *parensis var. tristis* Blöte, 20: 275 [n. var., Peru; sin. by Packauskas 2010].
2010 *Acanthocephala parensis*: Packauskas, 19.
2021 *Acanthocephala parensis*: CoreoideaSF Team.

Type material. ***Lectotype*** (here designated) ♀ (photograph), *Metapodius parensis* Dallas, type, syntype, BMNH(E) #651541 (NHMUK) (Fig. 2A); ***Paratype*** ♂ (photograph), Peru, *var. tristis* Blöte, Blöte det., paratypus, DEI Hemimetabola #100120 (SDEI).

Other examined material. (Table 1) Argentina: **Misiones:** 1 ♀, Gob. Misiones, 9-III-1897, S. Venturi col. (MACN); 1 ♀, P.N. Iguazú, CIES 25°40'40.8"S, 54°26'55.9"W, 8-XII-2013, T. de luz, P. Dellapé col. (MLP). Bolivia**:** 1 ♂, 2 ♀♀ (MACN); **Beni:** 2 ♂♂, 1 ♀, Rurrenabaque, X-1956, 175 mts., Dirings col. (MZSP); **Cochabamba:** 1 ♂, Zischka col. (MACN); 1 ♂, Chaparé, Yungas, I-1949, Suilar col. (MACN); 2 ♂♂, Chaparé, S.F. del Chipiriri, 400 m, IV-1953, Martinez col. (MACN); **Santa Cruz:** 1 ♂, Ichilo, Fr. Steinbach col. (UNAM);

1 ♂, 3 ♀♀, B. Vista, II-1950, A. Martinez col. (MACN); 2 ♂♂, Sara, II-1950, A. Martínez col. (MZSP); 1 ♂, 1 ♀, Santiago de Chiquitos, 8/13-II-1958, Monrós col. (IFML); 1 ♂, Tacú Polilla, 8-III-1957, A. Martinez col. (MACN). Brazil: **Amazonas:** 3 ♂♂, 4 ♀♀, Benjamin Constant, Río Javary, Alto Amazonas, III/V/VIII-1942, Dirings col. (MZSP); 2 ♂♂, 1 ♀, Sao Paulo de Oliveacea, Río Solimoes, XII-1960, Dirings col. (MZSP); **Bahía:** 2 ♀♀, Mucurí, I-1972, P.C. Elias col. (MZSP); **Goiás:** 1 ♀, Jataí, I-1964, Martins, Morgante & Silva cols. (MZSP); **Mato Grosso:** 1 ♂, 2 ♀♀, Koslorosky col. (MLP); 1 ♂, 1 ♀, Barra do Tapirapé, 14-I-1964 y 2/16-I-1966, B. Malkin col. (MZSP); 2 ♀♀, Río Papagayo, Utiariti, 23-XI-1966, S.J. Williner col. (MACN); **Pará:** 2 ♂♂, Itaítuba, Río Tapajoz, II-1952 / VII-1963, Dirings col. (MZSP); 1 ♂, Belem, Granja St. Hort., VIII-1955, E.F. Braganca col. (MZSP); 1 ♂, Santarem, Río Tapajoz, VIII-1955, Dirings col. (MZSP); 1 ♀, Óbidos, Traíra, IV-1962, Dirings col. (MZSP); 1 ♂, Sao Felix do Xingui Pa, XII-1980, K. Zanol leg., col. MCN 45373 (UFRGS); **Rodônia:** 1 ♂, 4 ♀♀, Porto Velho, Río Tapirapé, 10/12-XII-1964, R.T. Lima col. (MZSP); **São Paulo:** 2 ♀♀, Magda, 3/10-I-1959, J. Lane col. (MZSP); **Santa Catarina:** 2 ♂♂, 1 ♀, Rio Vermelho, IV-1963, Dirings col. (MZSP). Colombia: **Amazonas:** 1 ♂, Leticia, Monilla Amena, Chagra, 60 msnm, captura manual, 10-X-2002, Varela M.E., Celis C. & Arango J. cols. (PUJ); 2 ♀♀, Leticia, Km7 Tarapacá, 1-V-2002 (UNAL); 1 ♂, Leticia, Monilla Amena, 70 msnm, BTF., pit fall, 24-III-2004, D. Díaz col. (PUJ); **Boyacá:** 1 ♂, Santa María, sendero ecológico, 1200 m, IV-1997, G. Amat col. (UNAL); **Cundinamarca:** 1 ♀, Ubalá, Ins. Pol. San Pedro de Jágua, Vda. Soya, Mgen. Izq. Río Zaguea, aprox. 4°42'48", 3°18'06"W, 500 m, IV-1998 (UNAL). Paraguay: 1 ♂, I-47, Bridarolli col. (MACN); **Amambay:** 1 ♂, Pablo Juan Caballero, 16-I-48 (MACN); **Canindevu:** 1 ♀, Reserva Natural del Bosque Mbaracayú, 2/5-XIII-2017, 24°08'03"S, 55°31'43"W, 598 ft., J.E. Eger col. (MLP); **Concepción:** 1 ♂, Cororó, Río Ypane, 26-I-1965, S.J. Williner col. (MACN); **Itapúa:** 1 ♀, Hotel Tirol, 13 al 15-XII-2017, 27°11'00"S, 55°46'42"W, 827 ft., J.E. Eger col. (MLP); San Pedro: 2 ♂♂, 1 ♀♀, S. Estanislao, I-46, Bridarolli col. (MACN); 1 ♂, S. Estanislao, 15-I-1948, Foerster, Col. A.A. Pirán (MACN). Peru: **Huánuco:** 1 ♂, Tingo María (Río Huallaga), 700 m, 1-IV-1940, Leg. Weyrauch (IFML); 1 ♂, Tingo María, 670 m, Leg. Weyrauch (IFML); **Junín:** 1 ♂, Provincia Juaja, Satipo, 750m, 4-VI-38, Kurt Meskendahl col. (UNAM), 1 ♂, Satipo, 650 m., VIII-1940, Leg. Weyrauch. (IFML); **San Martín:** 1 ♀, Yuracyacu, 300 m., VI-1947, Weyrauch col. (IFML).

Diagnosis. Species dark brown to black, with the apex of scutellum, apex of metatibia and metatarsus yellowish. Distiflagellomere bicolorous, dark brown with a yellow ring on apical third near the apex. Veins of clavus and embolium contrasting reddish. Abdominal tergites black, with a central yellowish line extending along all segments. Eyes with its major axis perpendicular to the dorsal margin of head in lateral view. Thoracic pleurae with three conspicuous patches of decumbent yellowish setae. Metathoracic acetabulum in males with a rounded projection. Metatibia with fusiform expansions. Posteroventral margin of pygophore with a small median depression. Expansion of the spermathecal duct small and oval.

Redescription. Male. General color dark brown to black. ***Head.*** With sparse erect yellowish setae; dorsal region black with two paler areas next to ocelli (Fig. 2C); tylus, sides of the neck and buccula light brown. Dorsal margin of tylus slightly raised in the base and declined to the apex, reaching dorsal margin of head (Fig. 2B). Post-tylar depression shallow, two times shorter than interocellar space. Interocular distance at least 1.6 times longer than width of an eye. Eye with its major axis perpendicular to the dorsal margin of head in lateral view (Fig. 2B). Scape, pedicel and basiflagellomere light brown, with abundant short and thick semierect yellowish setae. Distiflagellomere bicolor, dark brown to black with a yellow ring near the apex, with abundant short decumbent yellowish setae, and sparse semierect darker setae. Labium light brown, apex of segment IV black, extending to the posterior margin of the mesocoxae. Labial segment I longest, segment IV shortest. ***Thorax.*** Pronotum dark brown, anterior lobe and calli with abundant long erect yellowish setae; posterior lobe densely and irregularly punctate, anterior third rough and shiny with thick erect yellowish setae, and posterior third with sparse short decumbent yellowish setae; humeral angles not elevated; humeral distance 1.2 times larger than width of abdomen; posterolateral margin tuberculate only on anterior region. Scutellum almost longer than wide, with a medial transversal depression with abundant decumbent yellowish and sparse semierect setae; apex yellowish. ***Hemelytra*:** Clavus and embolium with contrasting reddish veins; membrane dark brown to black, veins paler. Thoracic pleurae brown, with three patches of decumbent yellowish setae (Fig. 2D); metathoracic scent gland auricle and evaporatory area brown; projection of metathoracic acetabulum rounded (Fig. 2E). Thoracic sterna dark brown, with abundant erect yellowish setae. ***Legs*:** Femora brown with semierect yellowish setae over the surface, and longer erect setae on ventral margin. Pro- and mesofemora with the anterior row of spines on ventral margin ending in a small apical spine, posterior row ending in a larger spine. Metafemur at least three times wider than profemur (Fig. 3A); dorsal margin with two rows of darker conical setiferous tubercles; ventral margin with two rows of spines that become larger to the apex and ends in a flat bidentate projection: anterior row with larger black flat spines, posterior row smaller and ends in a larger spine; posterior margin with a row of rounded tubercles. Pro- and mesotibiae brown. Metatibia brown with the apex yellowish (Fig. 3C); dorsal expansion narrow and fusiform, maximum width at basal

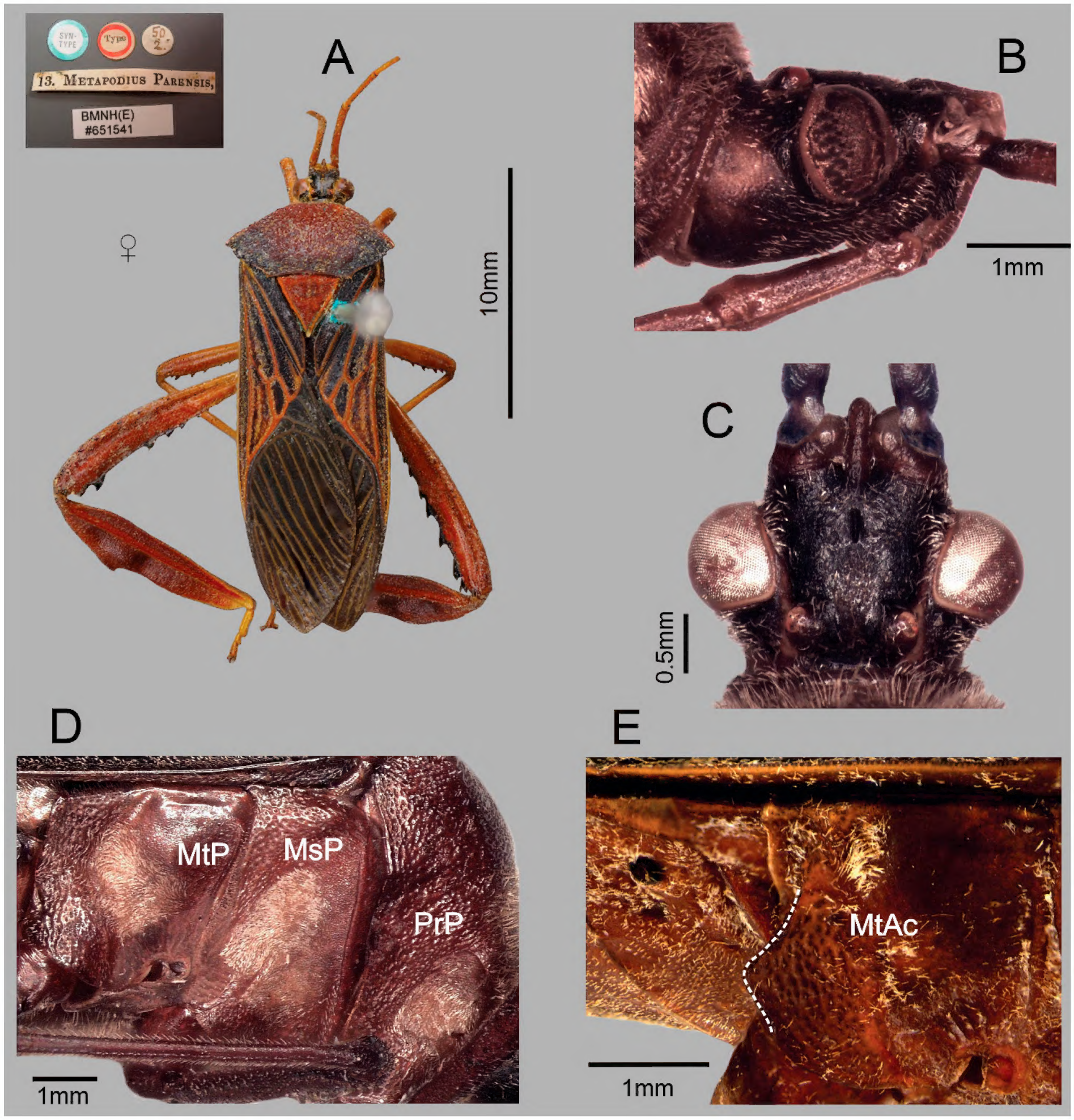

Figure 2. *Spilopleura parensis* (Dallas). **A** Lectotype female in dorsal view and labels; **B** Head in lateral view; **C** Head in dorsal view; **D** Thoracic pleurae; **E** Projection of metathoracic acetabulum in males. Abbreviations: MsP: mesopleura; MtAc: metathoracic acetabulum; MtP: metapleura; PrP: propleura.

third, narrowing to the apex, ending in an acute angle, with small setiferous tubercles on margin of distal third; ventral margin slightly expanded, evident on basal third of tibia; margin bordered with two rows of conical irregular setiferous tubercles that become larger to distal third forming only one row. Pro- and mesotarsi brown, metatarsus yellowish. ***Abdomen.*** Dorsum black with a central yellowish line extending along all abdominal tergites. Sterna brown, with short yellowish decumbent setae more abundant on lateral margins. Abdominal expansion developed on the anterior half, reaching spiracles. Area of insertion of trichobothria yellowish, surrounding area brown. Lateral areas of the abdominal sterna punctate near spiracles. Spiracles black. ***Male genitalia*:** Pygophore (Fig. 4A–C): Lateral margins straight and abruptly declivent at median third to the apex; posteroventral margin rounded with a small median depression; lateral margins of the anterior opening sinuous on medial part; parandria slightly developed. Parameres (Fig. 4D): Basal shank wide, dorsal region rounded, slightly narrowing at the joint with the arm, inner margin straight and slightly expanded distally, outer margin convex; arm wide, shorter than basal shank. ***Aedeagus*** (Fig. 4E, F): dorsal conjunctival appendages I bilobate apically, with a small median depression between lobes.

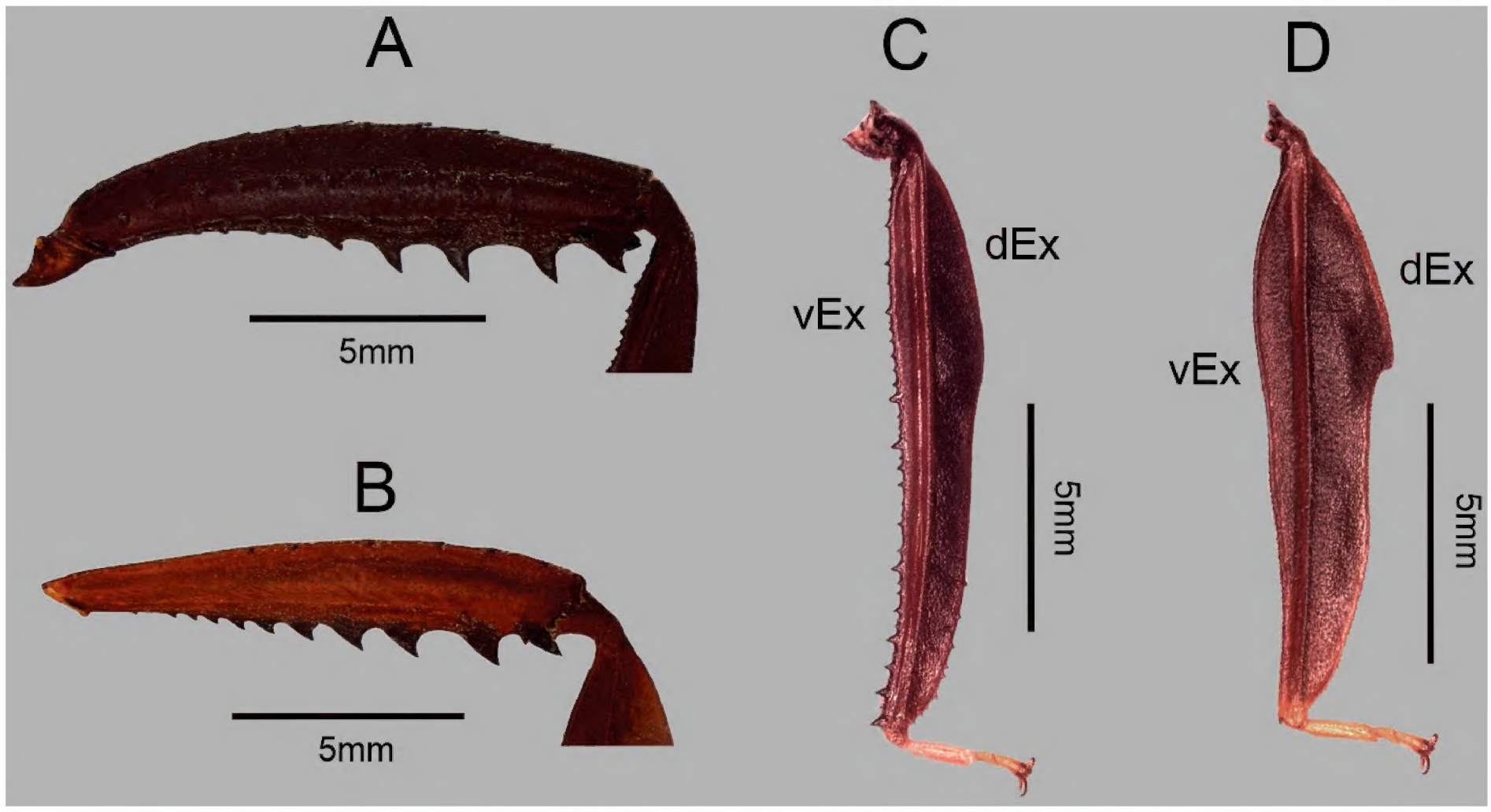

Figure 3. *Spilopleura parensis* (Dallas). **A** Male metafemur; **B** Female metafemur; **C** Male metatibia; **D** Female metatibia. Abbreviations: dEx: dorsal expansion of metatibia; vEx: ventral expansion of metatibia.

Variation (observed in some specimens examined): Apex of tylus slightly projected upwards.

Female. ***Thorax.*** Humeral distance as wide as the width of abdomen. Posterior row of spines on ventral margin of pro- and mesofemora absent. Metafemur at least two times wider than profemur (Fig. 3B); dorsal margin with two rows of small darker conical setiferous tubercles; posterior row of spines on the ventral margin reduced, with tiny spines that ends in a larger spine; posterior margin unarmed. Metatibia with the dorsal expansion fusiform, maximum width at basal third, with a tooth or notch from where it narrows to the apex (Fig. 3D); ventral expansion narrow and fusiform, extending throughout the length of the tibia. ***Abdomen*:** Female genitalia: Sternite VII (Fig. 5A): Fisura short, median lobes small, rounded, not overlapping with each other; plica slightly concave, close to the posterior margin of the sternite, longer than maximum width of first gonocoxae; posterolateral margins reaching the distal third of first gonocoxae. Paratergite VIII overpassing the apex of first gonocoxae (Fig. 5A). Dorsal apodeme of first gonocoxa short and wide, quadrangular (Fig. 5B). Second gonapophysis digitiform, first ramus slender and well sclerotized (Fig. 5C). Second gonocoxa wide, slightly narrowing at middle, basal region narrower than apical region (Fig. 5D). Second gonapophysis as long as second gonocoxa (Fig. 5D). ***Spermatheca*** (Fig. 5E): Receptacle apically globose and oval; flexible zone long; distal duct shorter than flexible zone; dilation of the spermathecal duct oval.

Measurements (n= 5♂ | 5♀): Total length: ♂ 18 -(20.727)- 22.625 / ♀ 18 -(20.37530)- 23.74; head length: ♂ 1.992 -(2.054)- 2.112 / ♀ 1.944 -(2.097)- 2.136; max head width: ♂ 2.432 -(2.645)- 2.816 / ♀ 2.432 -(2.609)- 2.72 tylus length: ♂ 0.736 -(0.837)- 0.992 / ♀ 0.64 -(0.789)- 0.96; post-tylus depression length: ♂ 0.288 -(0.313)- 0.336 / ♀ 0.24 -(0.256)- 0.272; eye width: ♂ 0.688 -(0.726)- 0.752 / ♀ 0.72 -(0.771)- 0.832; interocular space: ♂ 1.088 -(1.22)- 1.376 / ♀ 1.056 -(1.194)- 1.312; ocellar distance: ♂ 0.896 -(1.06)- 1.216 / ♀ 0.928 -(1.036)- 1.12; interocellar space: ♂ 0.576 -(0.72)- 0.8 / ♀ 0.608 -(0.707)- 0.832; antennal articles length: scape, ♂ 4 -(4.582)- 5 / ♀ 3.635 -(4.185)- 5; pedicel, ♂ 3.5 -(3.816)- 4.25 / ♀ 2.875 -(3.511)- 4.25; basiflagellomere, ♂ 2.875 -(3.419)- 3.75 / ♀ 2.875 -(3.221)- 3.75; distiflagellomere, ♂ 7.25 -(8.1)- 9.125 / ♀ 6.75 -(7.432)- 8.125; antennal articles width: scape, ♂ 0.32 -(0.355)- 0.384 / ♀ 0.256 -(3.18)- 0.352; pedicel, ♂ 0.192 -(0.358)- 0.256 / ♀ 0.192 -(0.217)- 0.256; basiflagellomere, ♂ 0.192 -(0.226)- 0.256 / ♀ 0.192 -(0.211)- 0.224; distiflagellomere, ♂ 0.228 -(0.25)- 0.256 / ♀ 0.224 -(0.288)- 0.352; labial segments length: I, ♂ 1.692 -(1.875)- 2.021 / ♀ 1.115 -(1.854)- 1.739; II, ♂ 1.551 -(1.725)- 1.88 / 1.504-(1.684)- 1.88; III, ♂ 1.363 -(1.493)- 1.696 / ♀ 1.363 -(1.485)- 1.786; IV, ♂ 1.363 -(1.433)- 1.568 / ♀ 1.269 -(1.365)- 1.457; humeral angles width: ♂ 6.65 -(8.03)- 8.55 / ♀ 7.125 -(7.983)- 8.75; scutellum length: ♂ 2.538 -(2.877)- 3.29 / ♀ 2.585 -(2.873)- 3.243; scutellum width: ♂ 2.538 -(2.925)- 3.29 / ♀ 2.632 -(2.978)- 3.29; hemelytra length: ♂ 15.625 -(17.375)- 18.75 / ♀ 15.125 -(17.139)- 18.75; profemur width: ♂ 0.768 -(0.828)- 0.912 / ♀ 0.72 -(0.777)- 0.832 ; metafemur width: ♂ 1.76 -(2.558)- 3.2 / ♀ 1.6 -(1.75)- 1.952; metafemur length: ♂ 10.75 -(12.276)- 13.75 (12.276)/ ♀ 10.625 -(10.833)- 11.5; metatibia

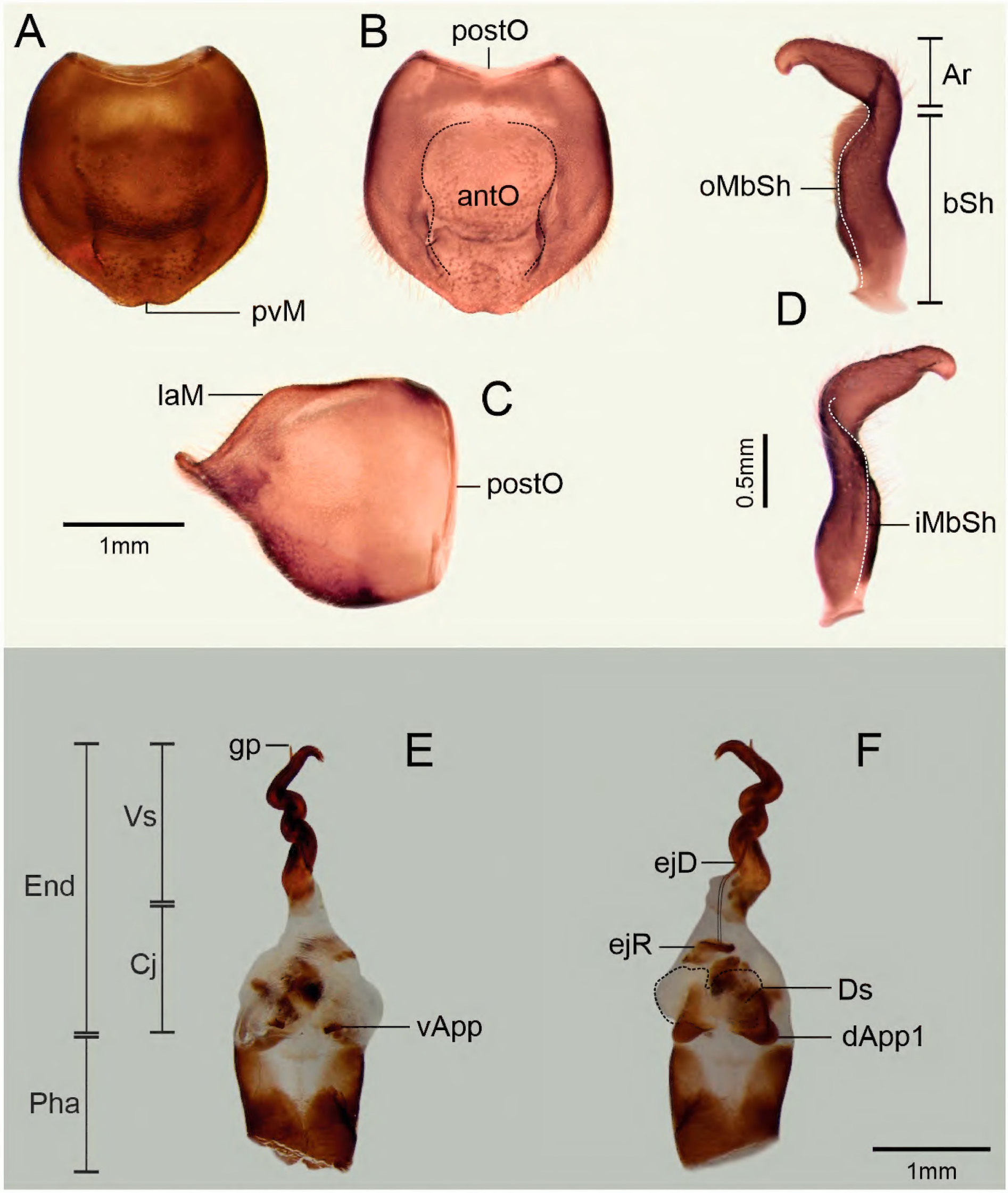

Figure 4. *Spilopleura parensis* (Dallas). Male genitalia. **A–C** Pygophore: **A** Ventral view: **B** Dorsal view; **C** Lateral view; **D** Right paramere in both views; **E, F** *Aedeagus*: **E** Ventral view; **F** Dorsal view. Abbreviations: antO: pygophore anterior opening; Ar: paramere arm; bSh: paramere basal shank; Cj: *Aedeagus* conjunctiva; dApp1: dorsal conjunctival appendages I; Ds: dorsal sac of conjunctiva; ejD: ejaculatory duct; ejR: ejaculatory reservoir; End: endosoma; gp: gonopore; iMbSh: inner margin of paramere basal shank; laM: pygophore lateral margin; oMbSh: outer margin of paramere basal shank; Pha: phallosoma; postO: pygophore posterior opening; pvM: pygophore posteroventral margin; vApp: ventral conjunctival appendages; Vs: vesica.

width: ♂ 1.52 -(1.945)- 2.24 / ♀ 2.304 -(2.733)- 3.104; metatibia length: ♂ 10.875 -(12.152)- 13.75 / ♀ 9.626 -(11.152)- 11.75; abdomen length: ♂ 9.75 -(10.983)- 12.5 / ♀ 9.625 -(11.041)- 13.5; abdomen width: ♂ 5.5 -(6.5)- 7.125 / ♀ 6.125 -(7.272)- 8.15.

Distribution. Bolivia, Brazil, Peru, and first records from Argentina, Colombia, and Paraguay (Fig. 10).

Remarks. A single female specimen with a label "syntype" deposited in the Natural History Museum of London (detailed in material examined and examined

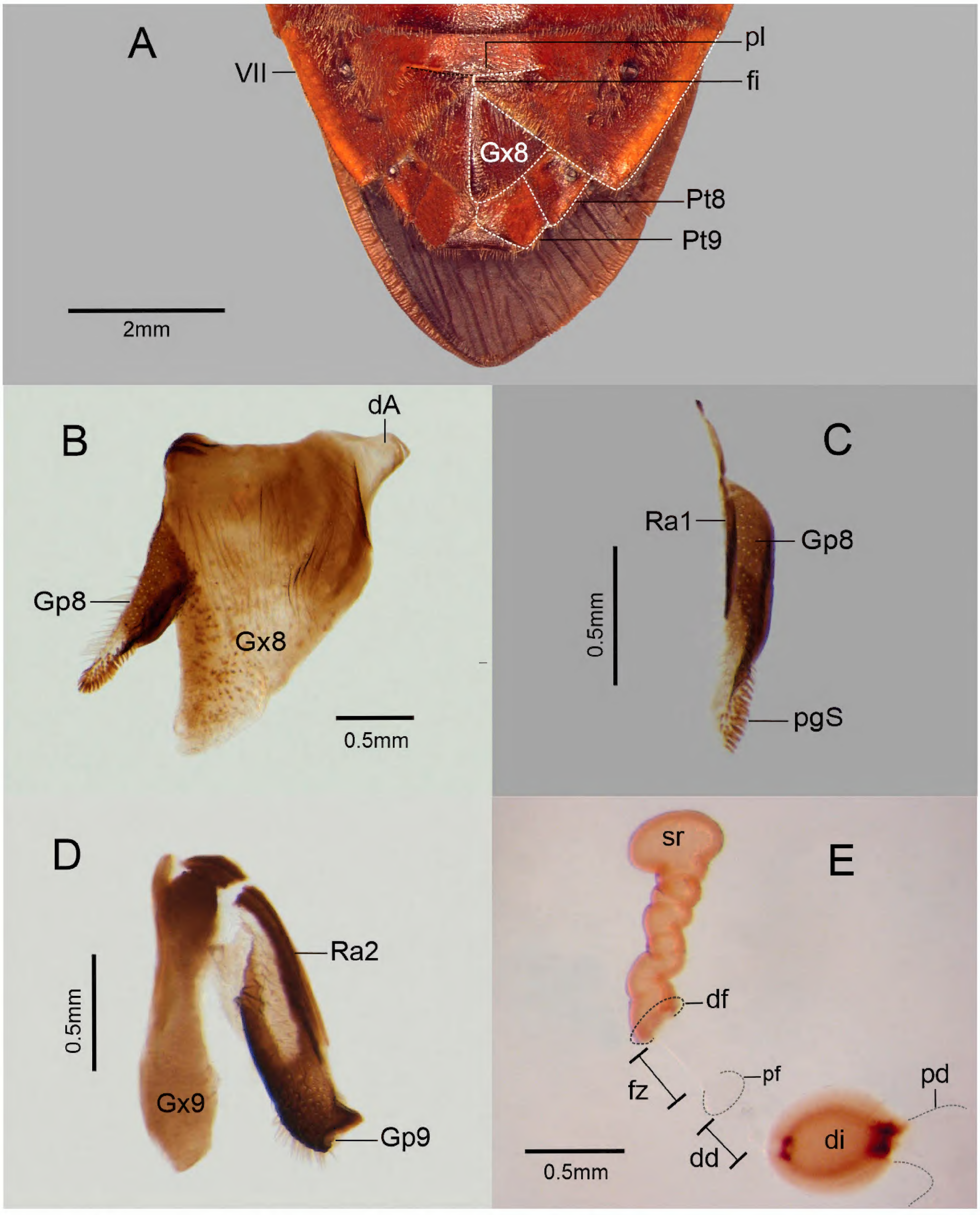

Figure 5. *Spilopleura parensis* (Dallas). Female genitalia. **A** Ventral view of the pregenital region and genital plates; **B** First gonocoxa and first gonapophysis; **C** First gonapophysis; **D** Second gonocoxa and second gonapophysis; **E** Spermatheca. Abbreviations: dA: dorsal apodem; dd: distal duct; df: distal flange; di: dilatation of the sphermatecal duct; fi: fisura; fz: flexible zone; Gp8: first gonapophysis; Gp9: Second gonapophysis; Gx8: first gonocoxa; Gx9: second gonocoxa; pd: proximal duct; pf: proximal flange; pgS: peg-like setae; pl: plica; Pt8: paratergite VIII; Pt9: paratergite IX; Ra1: first ramus; Ra2**:** second ramus; sr: seminal receptacle; VII**:** Sternite VII.

through photographs) is the only type material of *Metapodius parensis* Dallas we found.

To ensure nomenclatural stability, we select this specimen (Fig. 2A) as the lectotype.

The analysis of the characters exhibited in the photograph examined of the male paratype of *A.* (*S.*) *parensis* var. *tristis* Blöte allows us to confirm the synonymy under *Spilopleura parensis* as proposed by Packauskas.

Spilopleura ochracea (Montandon, 1895), comb. nov.

Figs 6–9

http://lsid.speciesfile.org/urn:lsid:Coreoidea.speciesfile.org:TaxonName:453707

1895 *Acanthocephala ochracea* Montandon, 8, pl. 1, fig. 3 [n. sp., Brazil, illustration].

1913 *Acanthocephala ochracea*: Bergroth, 129.

2010 *Acanthocephala ochracea*: Packauskas, 18.

2021 *Acanthocephala ochracea*: CoreoideaSF Team.

Type material. ***Holotype*** ♀ (photograph), *Acanthocephala* (*Metapodius*) *ochracea* Montandon, Bresíl du Nord, Cumbase, type, holotype, Romania (MGAB) (Fig. 6A, B).

Other examined material. (Table 1) Brazil: **Mato Grosso:** 1 ♂, Parque Nacional Xingu, 12/17-II-1965, P.E. Vanzo col. (MZSP). Paraguay: **Itapúa:** 1 ♀, Capitán Miranda, Hotel Tirol, 13/15-XII-2017, 27°11'00"S, 55°46'42"W, 827 ft., J.E. Eger col. (MLP). Peru: **Junín:** 1 ♂, Satipo, 750 m, 12-XI-1938, K. Meskendahl col., H. Brailovsky det. (UNAM); **Lima:** 1 ♂, Montenegro, Río Marañon, 06-X-1961, S.J. Williner col. (MACN).

Diagnosis. Species entirely yellowish ochraceous, with the anterior region of the metaepisternum darker, and with two dark brown central lines extending along all abdominal tergites. Eyes with its major axis oblique to the dorsal margin of head in lateral view. Thoracic pleurae with sparse setae, never forming a patch. Metatibia with lanceolate expansions. Posteroventral margin of

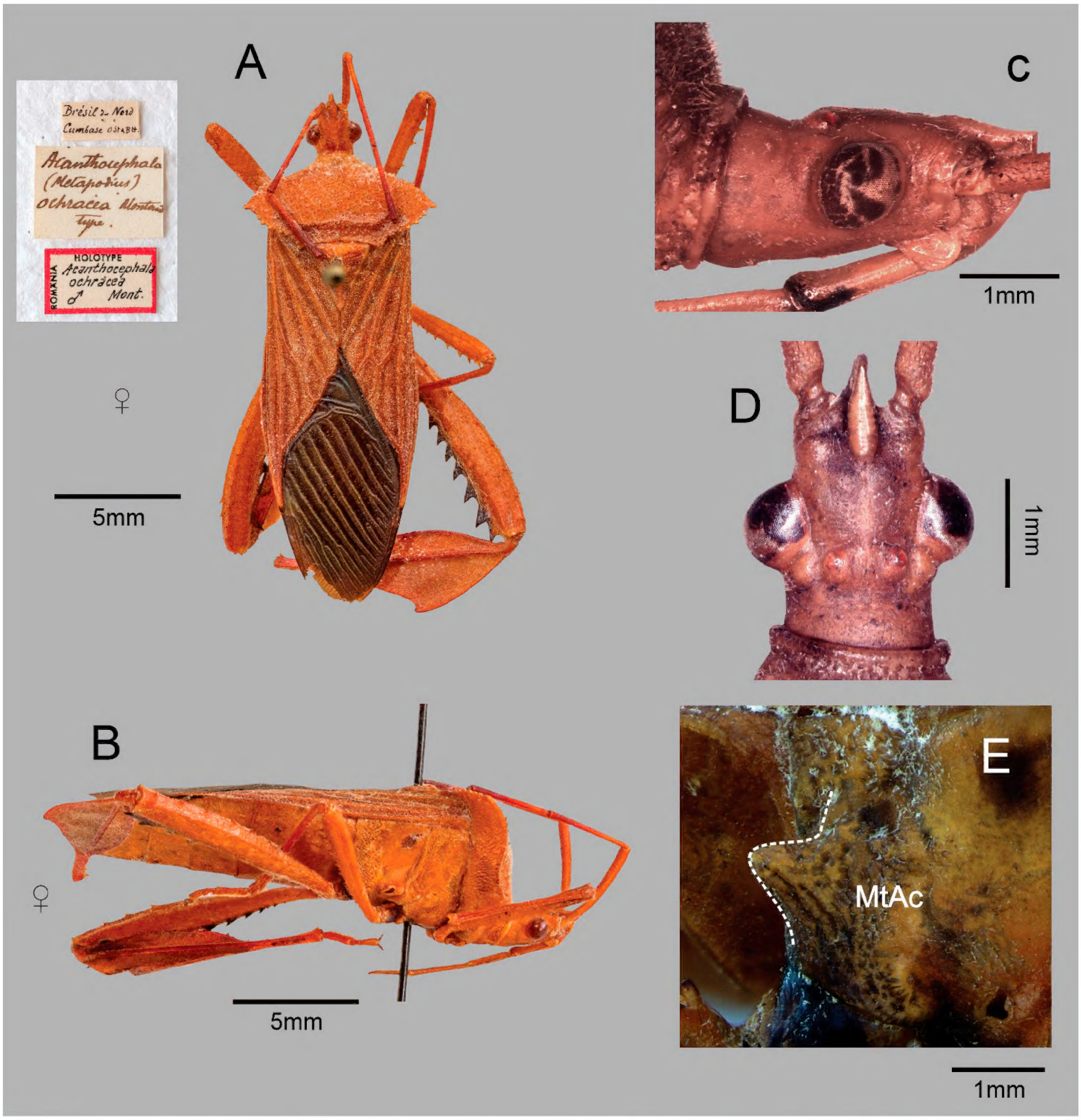

Figure 6. *Spilopleura ochracea* (Montandon). **A** Holotype female in dorsal view and labels; **B** Holotype female in lateral view; **C** Head in dorsal view; **D** Head in lateral view; **E** Projection of metathoracic acetabulum in males. Abbreviations: MtAc: metathoracic acetabulum.

pygophore entire, without a median depression. Expansion of the spermathecal duct tubular, long and curved.

Redescription. Male. General color yellowish ochraceous. ***Head.*** With sparse erect and semierect yellowish setae (Fig. 6C). Dorsal margin of tylus straight, declined, and compressed to the apex, not surpassing dorsal margin of head (Fig. 6D). Post-tylar depression shallow, three times shorter than interocellar space. Interocular distance at least two times longer than the width of an eye. Eye with its major axis oblique to the dorsal margin of head in lateral view (Fig. 6D). Antennae ochraceous; scape, pedicel and basiflagellomere with abundant short and thick semierect dark setae; distiflagellomere with abundant short decumbent yellowish setae, and sparse semierect darker setae. Labium ochraceous, apex of segment IV dark brown, surpassing mesocoxae. Labial segment III longest, segment IV shortest. ***Thorax.*** Pronotum ochraceous, anterior lobe and calli with abundant erect yellowish setae; posterior lobe punctate, anterior third with short and thick erect yellowish setae, and posterior third with sparse short decumbent yellowish setae; humeral angles slightly elevated; humeral distance 1.3 times larger than width of abdomen; posterolateral margin with well-developed tubercles on its entire length. Scutellum ochraceous with the apex concolorous, longer than wide, transversely striated, with sparse decumbent yellowish setae. ***Hemelytra*:** Clavus and embolium ochraceous, veins concolorous; membrane dark brown, veins concolorous. Thoracic pleurae yellowish ochraceous with the anterior region of the metaepisternum darker, with sparse erect and decumbent yellowish setae; auricle of metathoracic gland and evaporatory area concolorous with pleurae; projection of metathoracic acetabulum conical (Fig. 6E). Thoracic sterna dark brown, with abundant erect yellowish setae. ***Legs*:** Femora ochraceous, with semierect yellowish setae over the surface, and with longer erect setae on ventral margin only in the metafemur. Pro- and mesofemora with the rows of spines on ventral margin ending in a larger apical spine. Metafemur at least 2.7 times wider than profemur (Fig. 7A); dorsal margin with two rows of concolorous conical setiferous tubercles with the apex darker, anterior row shorter and less developed; ventral margin with two rows of spines that become larger to the apex and ends in a flat dentate projection: anterior row with larger flat spines, posterior row smaller and ends in a larger spine; posterior margin with a row of conical tubercles. Tibiae ochraceous. Metatibia with the dorsal expansion wide and unarmed, maximum width at basal third, then abruptly narrowing to the apex, ending in an acute angle (Fig. 7C); ventral margin of basal third slightly expanded, margin bordered by two rows of conical irregular setiferous tubercles that become larger to the apex forming only one row. Tarsi yellowish-ochraceous. ***Abdomen.*** Dorsum ochraceous, with two darker central lines extending along all abdominal tergites. Sterna ochraceous, with sparse semierect yellowish setae. Abdominal expansion developed on the anterior half, reaching the spiracles. Area of insertion of trichobothria and surrounding area concolorous with sterna. Lateral area of the abdominal sterna striated near the spiracles. Spiracles brown. ***Male genitalia*:** Pygophore (Fig. 8A–C): Lateral margins rounded and abruptly declivent to the apex; posteroventral margin slightly rounded; lateral margins of anterior opening slightly sinuous, parandrias slightly developed. Parameres (Fig. 8D): Dorsal region of basal shank rounded, slightly narrowing at the middle third, inner margin

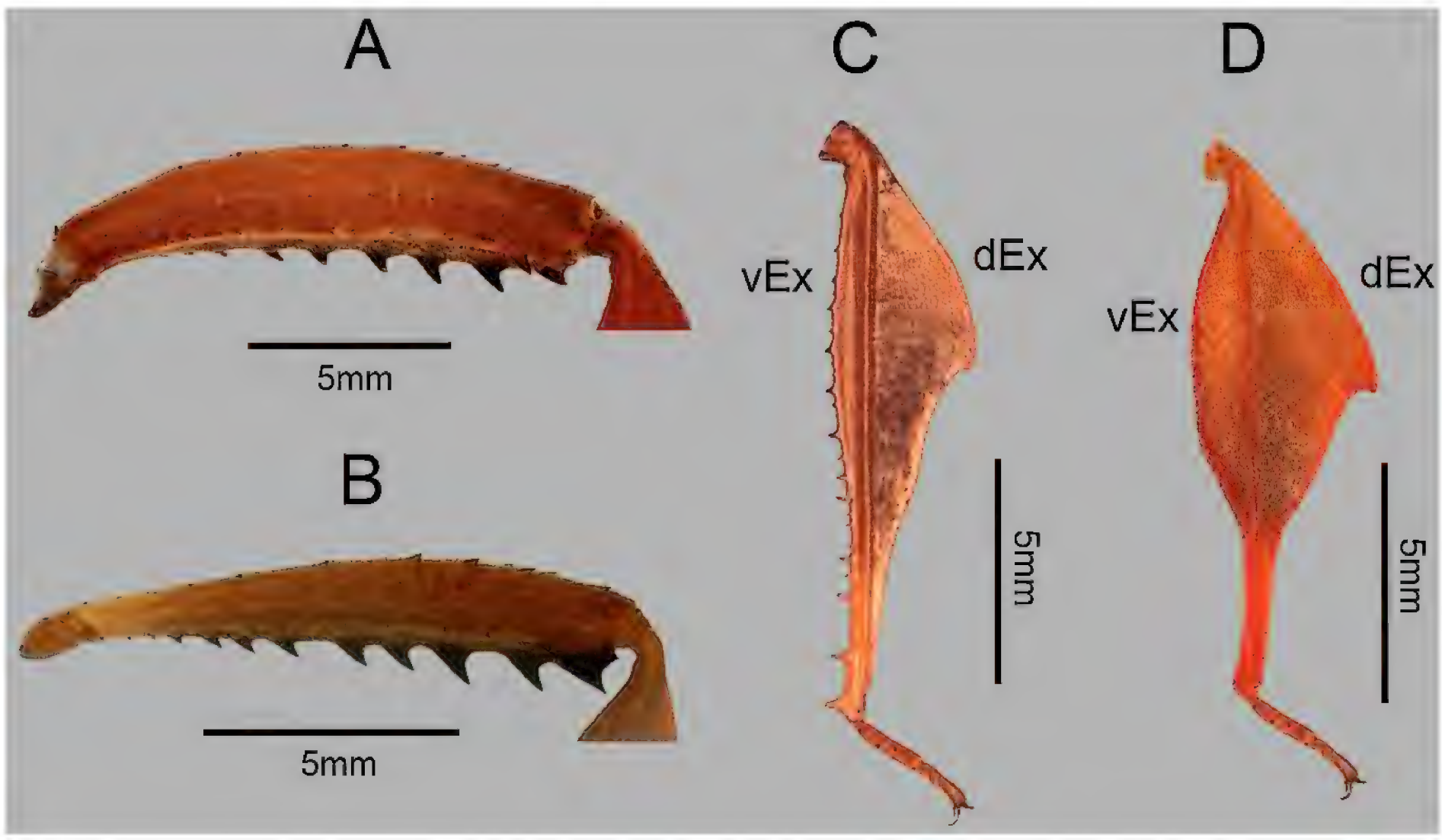

Figure 7. *Spilopleura ochracea* (Montandon). **A** Male metafemur; **B** Female metafemur; **C** Male metatibia; **D** Female metatibia. Abbreviations: dEx: dorsal expansion of metatibia; vEx: ventral expansion of metatibia.

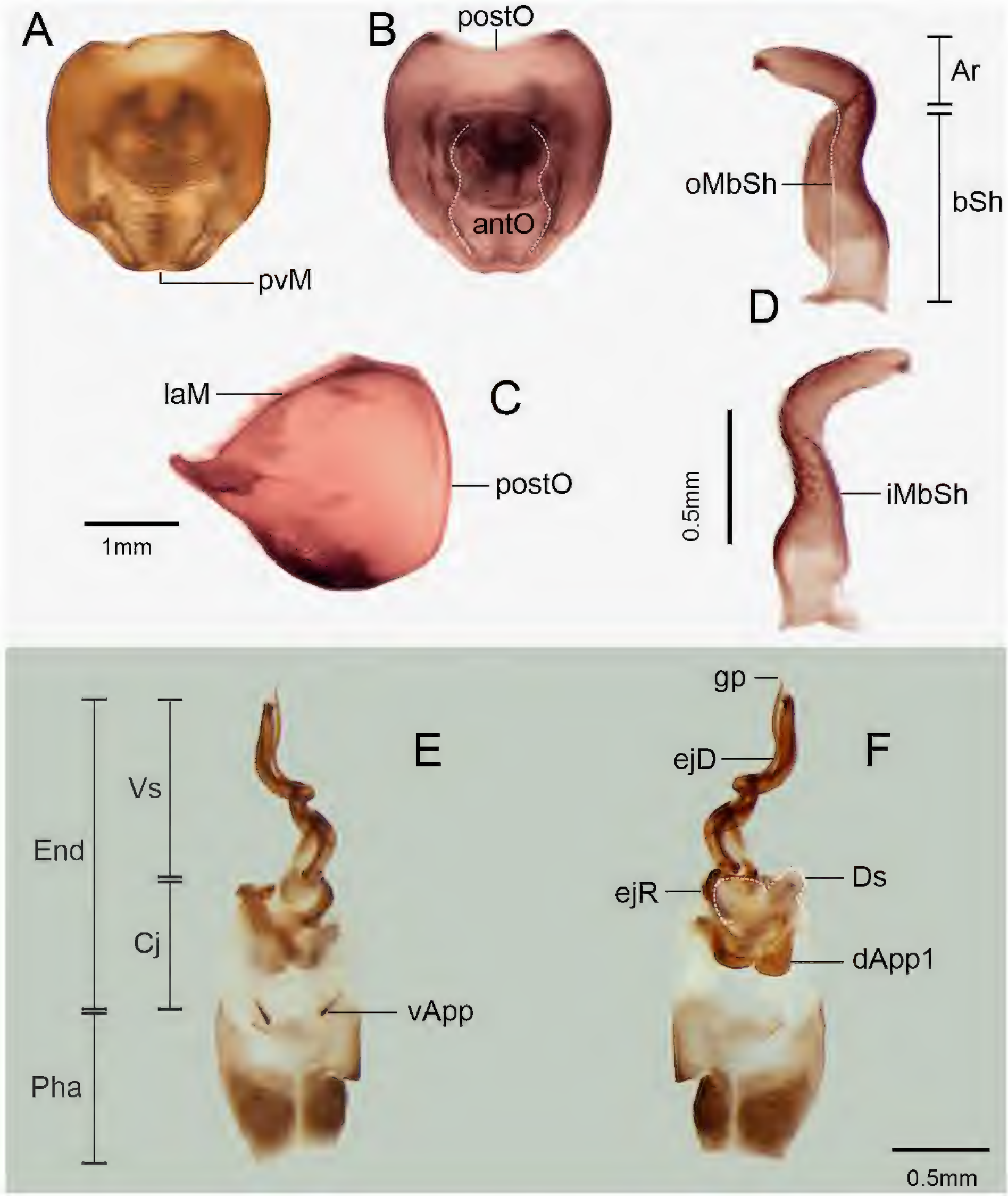

Figure 8. *Spilopleura ochracea* (Montandon). Male genitalia. **A–C** Pygophore: **A** Ventral view; **B** Dorsal view; **C** Lateral view; **D** Right paramere in both views; **E–F** *Aedeagus*: **E** Ventral view; **F** Dorsal view. Abbreviations: antO: pygophore anterior opening; Ar: paramere arm; bSh: paramere basal shank; Cj: *Aedeagus* conjunctiva; dApp1: dorsal conjunctival appendages I; Ds: dorsal sac of conjunctiva; ejD: ejaculatory duct; ejR: ejaculatory reservoir; End: endosoma; gp: gonopore; iMbSh: inner margin of paramere basal shank; laM: pygophore lateral margin; oMbSh: outer margin of paramere basal shank; Pha: phallosoma; postO: pygophore posterior opening; pvM: pygophore posteroventral margin; vApp: ventral conjunctival appendages; Vs: vesica.

straight slightly expanded distally, outer margin convex; arm wide and shorter than basal shank. ***Aedeagus*** (Fig. 8E, F): dorsal conjunctival appendages I subrectangular with the apical margin rounded, and with a small median membranous projection between each other.

Variation (observed in one specimen examined): Anterior margin of metaepisternum entirely ochraceous, without a darker area.

Female. ***Thorax.*** Humeral distance 1.2 times wider than the abdomen. Posterior row of spines on ven-

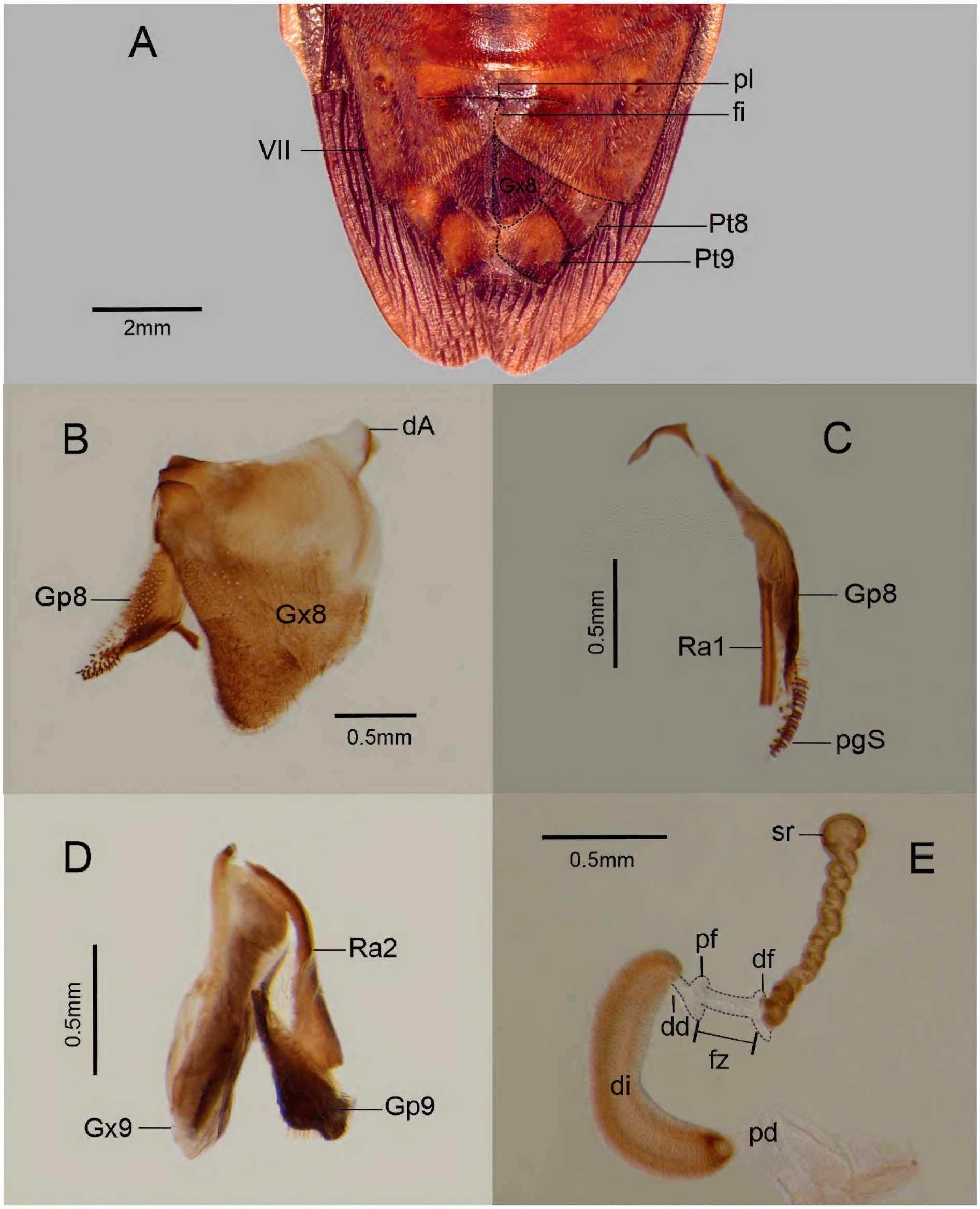

Figure 9. *Spilopleura ochracea* (Montandon). Female genitalia. **A** Ventral view of the pregenital region and genital plates; **B** First gonocoxa and first gonapophysis; **C** First gonapophysis; **D** Second gonocoxa and second gonapophysis; **E** Spermatheca. Abbreviations: dA: dorsal apodem; dd: distal duct; df: distal flange; di: dilatation of the sphermatecal duct; fi: fisura; fz: flexible zone; Gp8: first gonapophysis; Gp9: Second gonapophysis; Gx8: first gonocoxa; Gx9: second gonocoxa; pd: proximal duct; pf: proximal flange; pgS: peg-like setae; pl: plica; Pt8: paratergite VIII; Pt9: paratergite IX; Ra1: first ramus; Ra2: second ramus; sr: seminal receptacle; VII: Sternite VII.

tral margin of profemur absent. Metafemur ochraceous, at least 2.4 times wider than profemur (Fig. 7B); dorsal margin with two rows of small darker conical setiferous tubercles; anterior row of spines of ventral margin with darker spines, posterior row reduced, with tiny concolorous spines that ends in a larger spine; posterior margin with a row of tiny conical tubercles that extends until basal third. Metatibia with lanceolate expansions (Fig. 7D);

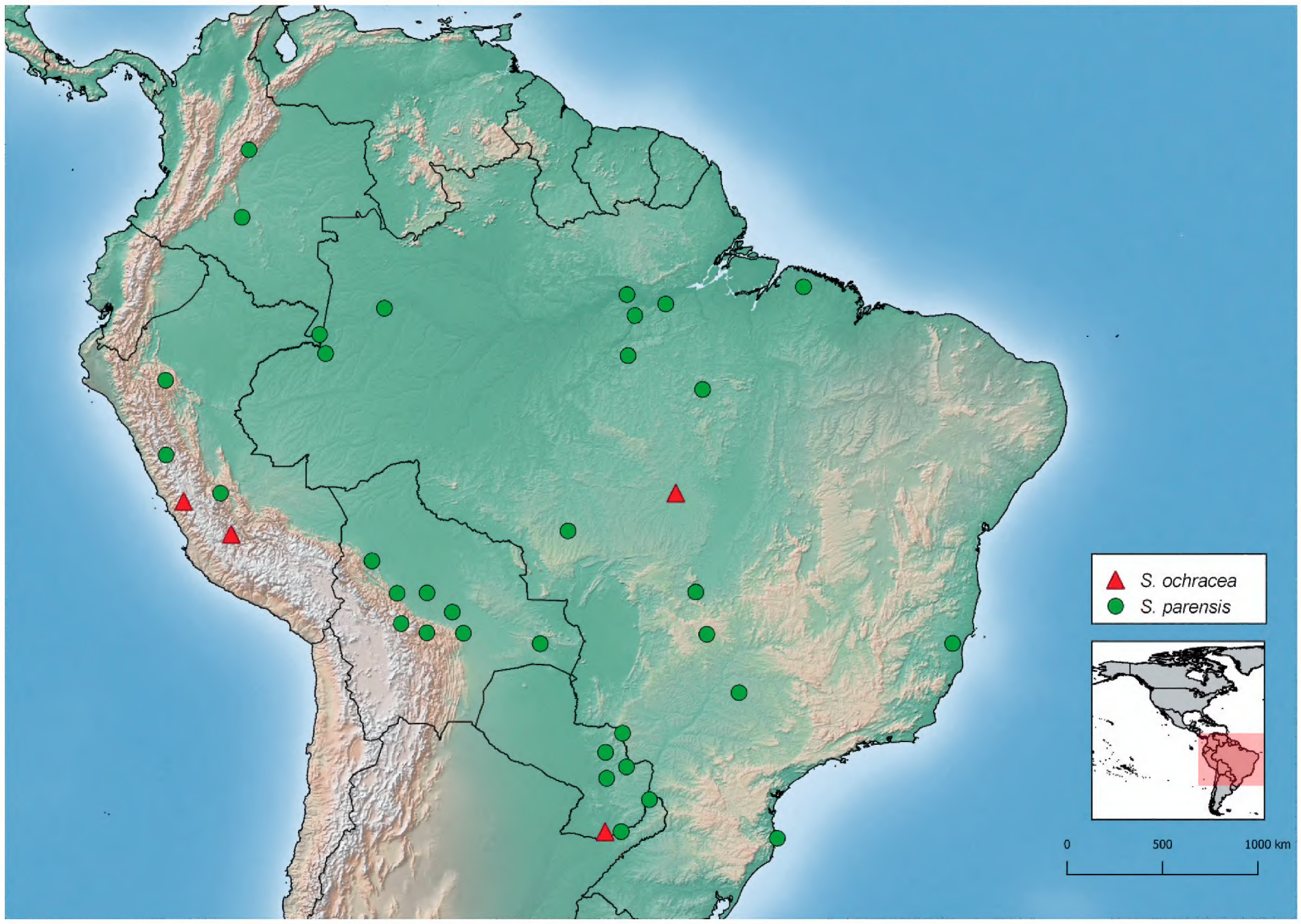

Figure 10. Distributional map of the species includes in the genus *Spilopleura* stat. nov. Green dots represent occurrences of *S. parensis* (Dallas); red triangles represent occurrences of *S. ochracea* (Montandon) comb. nov.

maximum width of dorsal expansion at basal third, with a tooth or notch from where it abruptly narrows to the apex; ventral expansion developed in basal half. ***Abdomen*:** Female genitalia: Sternite VII (Fig. 9A): Fisura long, median lobes well developed and quadrangular, overlapping with each other; plica straight, close to anterior margin of the sternite, longer than maximum width of first gonocoxae; posterolateral margins reaching the distal third of first gonocoxae. Paratergite VIII overpassing the apex of first gonocoxae (Fig. 9A). Dorsal apodeme of first gonocoxa short and wide, quadrangular (Fig. 9B). Second gonapophysis digitiform, first ramus stout and well sclerotized (Fig. 9C). Second gonocoxa wide, slightly narrowing at basal third, basal region as wide as apical region (Fig. 9D). Second gonapophysis shorter than second gonocoxa (Fig. 9D). ***Spermatheca*** (Fig. 9E): Receptacle apically globose and oval; flexible zone long; distal duct short; dilation of the spermathecal duct tubular, long and curved.

Measurements (n= 2♂ | 1♀): Total length: ♂ 24.375–24.625 / ♀ 21; head length: ♂ 2.72–2.88 / ♀ 2.496; max head width: ♂ 2.688–2.848 / ♀ 2.528 ; tylus length: ♂ 1.12–1.224 / ♀ 1.12; post-tylus depression length: ♂ 0.24 / ♀ 0.264; eye width: ♂ 0.672–0.72 / ♀ 0.624; interocular space: ♂ 1.32–1.44 / ♀ 1.248; ocellar distance: ♂ 1.024 / ♀ 0.896; interocellar space: ♂ 0.704 / ♀ 0.444; antennal articles length: scape, ♂ 4.625–5.32 / ♀ 3.807; pedicel, ♂ 4.5 / ♀ 3.76; basiflagellomere, ♂ 4.25 / ♀ 3.525; distiflagellomere, ♂ 9.875 / ♀ 5.605; antennal articles width: scape, ♂ 0.416–0.512 / ♀ 0.384; pedicel, ♂ 0.288 / ♀ 0.224; basiflagellomere, ♂ 0.288 / ♀ 0.224; distiflagellomere, ♂ 0.288 / ♀ 0.288; length of labial segments: I, ♂ 2.115–2.176 / ♀ 1.88; II, ♂ 1.88–2.08 / ♀ 1.88; III, ♂ 2.528–2.585 / ♀ 2.538; IV, ♂ 1.739–1.92 / ♀ 1.692; humeral angles width: ♂ 7.747–8.93 / ♀ 7.5; scutellum length: ♂ 3.232–3.296 / ♀ 2.82; scutellum width: ♂ 2.88 / ♀ 2.632; hemelytra length: ♂ 18–18.125 / ♀ 16.625; profemur width: ♂ 1.056 / ♀ 0.658; metafemur width: ♂ 2.656–2.848 / ♀ 1.598; metafemur length: ♂ 12.625–13.125 / ♀ 10.625; metatibia width: ♂ 3.04–3.2 / ♀ 2.867; metatibia length: ♂ 12.125–13 / ♀ 11.25; abdomen length: ♂ 11.875–12.5 / ♀ 11.25; abdomen width: ♂ 6.625–6.935 / ♀ 6.125.

Distribution. Brazil, and first record from Paraguay and Peru (Fig. 10).

Discussion

Stål (1870) established the subgenera mainly based on the shape of the metatibial expansions, the coloration of the abdominal tergites, and the presence of abdominal expansions in segment three. In *Spilopleura* the metatibial expansions are fusiform or lanceolate, and are developed along all the tibial length with the apex narrow in both

sexes, contrary to *Acanthocephala* where the metatibial expansions are fusiform only in males, or are well developed along all the tibia in both sexes but ends with the apex rounded or straight. In the case of the abdominal characters, the third abdominal sternite is not expanded laterally like in some *Acanthocephala* which present sub-triangular expansions; and the abdominal terga present contrasting longitudinal central lines (one or two) that extend along all abdominal segments, character absent in *Acanthocephala*.

In addition to the characters observed by Stål (1870), we were able to recognize a set of generic character states shared with other Acanthocephalini genera, but that allows to separate *Spilopleura* from *Acanthocephala*, such as: the apex of scutellum flat, the pronotal disc never tuberculate, and the metathoracic acetabulum in males with a conspicuous rounded or conical projection. On the other hand, in *Acanthocephala*, the apex of scutellum is swollen; the pronotal disc is always tuberculate; and the metathoracic acetabulum in males lacks a conspicuous projection.

Both genera share, but with different degrees of development, a conspicuously expanded metatibia, a character state also exhibited by *Cervantistellus*, *Empedocles*, *Ichilocoris*, *Lucullia*, *Meluchopetalops*, *Stenometapodus*, *Thymetus* and *Zygometapodus*. Among these, *Ichilocoris*, *Cervantistellus*, *Lucullia*, *Meluchopetalops*, *Stenametapodus*, *Zygometapodus*, and *Spilopleura* have the pronotal disc not tuberculate, unlike *Empedocles*, *Thymetus*, and *Acanthocephala*, which present the posterior pronotal lobe with tubercles of different degrees of development. On the other hand, *Lucullia*, *Zygometapodus* and *Spilopleura* present a conspicuous conical or rounded, never spine-like, projection in the metathoracic acetabulum in males. *Lucullia* and *Spilopleura* also have the apex of scutellum flat, never swollen as in the other genera. However, *Lucullia* species can be easy recognized and separated from *Spilopleura* by the metallic green iridescence coloration, the presence of a wide yellow longitudinal stripe extending across pronotal disk to apex of scutellum; and by the fusiform and slightly expanded metatibial expansions in both sexes.

Acknowledgements

This work was funded by the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina; and the Universidad Nacional de La Plata. We would like to thank John M. Leavengood for the critical reading of the manuscript.

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Supplementary material 1

Spilopleura Stål (status novum) distribution

Authors: Leonela Olivera, María Cecilia Melo, Pablo M. Dellapé

Data type: occurences

Explanation note: *Spilopleura* Stål (status novum) distribution.

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Link: https://doi.org/10.3897/evolsyst.7.94403.suppl1